AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0007] on page 3, as follows:

As a means for achieving the above object, the invention according to a first aspect comprises a refrigerating storage cabinet for refrigerating an inner atmosphere that includes a refrigeration unit comprising a compressor and an evaporator. The refrigerating storage cabinet comprises a storing means for storing a cooling characteristic comprising a target physical amount as a function of operating time. A physical amount sensor is able to detect a physical amount corresponding to the target physical amount at predetermined intervals of operating time. The compressor has a plurality of performance levels, and an operation control means controls the compressor by selecting an appropriate one of the plurality of performance levels based upon a relationship between the physical amount and the target physical amount for corresponding operating time.~~As means for achieving the above object, the invention of aspect 1 is a refrigerating storage cabinet in which an inner atmosphere is refrigerated by a refrigeration unit, including a compressor and an evaporator. This is characterized in that the compressor is of a variable performance type. In addition, this is characterized by storing means for storing data of a cooling characteristic indicative of a time-varying mode of a reduction in a target physical amount associated with cooling, such as an internal temperature, and also by operation control means for varying the performance of the compressor on the basis of the output of a physical amount sensor detecting the physical amount so that the physical amount is reduced by following the cooling characteristic read from the storage means.~~

Please amend paragraph [0008] on pages 8-9, as follows:

In according with a second aspect of the present invention, the physical amount and the target physical amount are temperatures. The physical amount is the temperature of the inner atmostphere. The compressor is controlled by the operation control means in which the cooling characteristic is a pull down characteristic, while the physical amount is in a temperature range from above a high temperature to near a set temperature. The high temperature is higher than the set temperature by more than a predetermined value.~~The invention of aspect 2 is characterized in that in aspect 1 the inner atmosphere is~~

~~modified to be refrigerated to a predetermined set temperature. The cooling characteristic is a pull-down cooling characteristic associated with a pull-down cooling zone, which is a temperature zone from a high temperature, apart from the set temperature, to near the set temperature.~~

Please amend paragraph [0009] on page 4, as follows:

According to a third aspect of the invention, an upper limit temperature is higher by the predetermined value than a set temperature. A lower limit temperature is lower by the predetermined value than the set temperature. A control-cooling zone is between and includes the upper limit temperature to the lower limit temperature. When the physical amount is in the control-cooling zone, the cooling characteristic is a control-cooling characteristic. The compressor is controlled by the operation control means, the control characteristic being a control-cooling characteristic when the physical amount is in the control-cooling zone from the upper limit temperature to the lower limit temperature. When the physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated. When the physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control means.~~The invention of aspect 3 is characterized in that in aspect 1 control-cooling is modified to be performed. The compressor is operated when the internal temperature has reached an upper limit temperature, higher by a predetermined value than the set temperature. The compressor is stopped when the internal temperature has reached a lower limit temperature, lower by a predetermined value than the set temperature. The compressor is repeatedly operated and stopped so that the inner atmosphere is maintained about the set temperature, whereby control-cooling is performed. The cooling characteristic is a control-cooling characteristic associated with the control-cooling zone.~~

Please amend paragraph [0010] on pages 4-5, as follows:

According to a fourth aspect of the invention, the compressor is a speed-controllable inverter compressor. The operation control means comprises a physical amount change computing section computing a physical amount reduction degree at the

predetermined intervals of operating time, a target physical amount reduction degree output section providing a target physical amount reduction degree corresponding to the predetermined intervals of operating time, a comparing section for comparing the physical amount reduction degree to the target physical amount reduction degree at a corresponding operation time, and a speed controlling section controlling the inverter compressor so that a rotational speed of the inverter compressor is increased when the comparing section indicates that the physical amount reduction degree is smaller than the target physical amount reduction degree. The rotational speed of the inverter compressor is decreased when the comparing section indicates that the actual physical amount reduction degree is larger than the target physical amount reduction degree.~~The invention of aspect 4 is characterized in that, in any of the aspects 1 to 3, the compressor is a speed-controllable inverter compressor. The operation control means comprises a physical amount change computing section computing a reduction degree of the physical amount on the basis of a signal of the physical amount sensor at each predetermined sampling time. A target physical amount reduction degree output section provides a target physical amount reduction degree in the physical amount at the sampling time, on the basis of the cooling characteristic stored in the storage means, at every sampling time. A comparing section compares the actual physical amount reduction degree computed by the physical amount change computing section with the target physical amount reduction degree produced by the target physical amount reduction degree output section. A speed control section controls the inverter compressor so that the speed of the inverter compressor is increased when the actual physical amount reduction degree is smaller than the target physical amount reduction degree, and so that the speed of the inverter compressor is decreased when the actual physical amount reduction degree is larger than the target physical amount reduction degree, based on the results of a comparison by the comparing section.~~

Please amend paragraph [0011] on page 5, as follows:

According to a fifth aspect of the present invention, the pull down characteristic is a linear function. The target physical amount reduction degree is a constant value,

further.~~The physical amount reduction degree is defined as an amount of reduction in the physical amount per unit of time.~~

Please amend paragraph [0012] on page 5, as follows:

According to a sixth aspect of the invention, the control-cooling characteristic is a linear function and the target physical amount reduction degree is a constant value.~~The invention of aspect 5 is characterized in that in aspect 4 the refrigerating characteristic is represented as a linear function involving a physical amount and time. The target physical amount reduction degree output section provides the target physical amount reduction degree as a constant value.~~

Please amend paragraph [0013] on page 5, as follows:

[0013] According to a seventh aspect of the invention, the control-cooling characteristic is a linear function.~~The invention of aspect 6 is characterized in that in aspect 4 the refrigerating characteristic is represented as a quadratic function involving a physical amount and time. The physical amount reduction degree output section computes a physical amount reduction degree in the physical amount at every sampling time, providing a computed value based on the quadratic function as the target physical amount reduction degree.~~

Please amend paragraph [0014] on pages 5-6, as follows:

According to an eighth aspect of the invention, the control-cooling characteristic is a quadratic function, and the pull down characteristic is a quadratic function.~~The invention of aspect 7 is characterized in that in aspect 4 the refrigerating characteristic is represented as an exponential function involving a physical amount and time. The physical amount reduction degree output section computes a physical amount reduction degree in the physical amount at every sampling time, providing a computed value based on the exponential function as the target physical amount reduction degree.~~

Please amend paragraph [0015] on page 6, as follows:

According to a ninth aspect of the invention, the control-cooling characteristic is represented as an exponential function, and the pull down characteristic is an exponential function.~~The invention of aspect 8 is characterized in that in aspect 4 a reference table is previously made so as to place a physical amount and a target physical amount reduction degree into a correspondence with each other on the basis of a cooling characteristic. The target physical amount reduction degree output section has a function of retrieving and providing the target physical amount reduction degree corresponding to the current physical amount in the reference table.~~

Please amend paragraph [0016] on pages 6-7, as follows:

According to a tenth aspect of the invention, a reference table is provided in which the target physical amount reduction degrees have been determined for a plurality of target physical amounts and stored in the reference table according to an associated target physical amount. An appropriate target physical amount reduction degree is retrieved by the target physical amount reduction degree output section from the target reduction table based on a correspondence between the physical amount and the associated target physical amount. A physical amount change computing section computes a physical amount reduction degree for the physical amount based on the physical amount and a previously measured physical amount. A physical amount reduction degree and the appropriate target physical amount reduction degree are used as inputs for the comparing section.~~The invention of aspect 9 is characterized in that in aspect 4 the inner atmosphere is modified to be refrigerated to a predetermined set temperature. The cooling characteristic is a pull down cooling characteristic associated with a pull down cooling zone, which is a temperature zone from a high temperature, apart from the set temperature, to near the set temperature. At a first half side of the pull down cooling zone, the pull down cooling characteristic is represented as a linear function involving a physical amount and time, and the target physical amount reduction degree output section provides the target physical amount reduction degree as a constant value. At a second half side of the pull down cooling zone, the pull down cooling characteristic is represented as a quadratic function involving a physical amount and~~

~~time, and the target physical amount reduction degree output section computes the physical amount reduction degree in the physical amount at every sampling time, providing a computed value based on the quadratic function as the target physical amount reduction degree. Alternatively, a reference table is previously made so as to place a physical amount and the target physical amount reduction degree into a correspondence with each other on the basis of a cooling characteristic. The target physical amount reduction degree output section has a function of retrieving and providing the target physical amount reduction degree corresponding to the current physical amount in the reference table.~~

Please amend paragraph [0017] on page 7, as follows:

According to an eleventh aspect of the invention, the pull down cooling zone includes a first pull down zone and a second pull down zone. The pull down characteristic includes a first pull down characteristic and a second pull down characteristic. The first pull down characteristic is used for the first pull down zone and is a linear function, wherein the second pull down characteristic is used for the second pull down part and is a quadratic function.~~The invention of aspect 10 is characterized in that in aspect 4 a plurality of programs are provided that vary the performance of the compressor so that a physical amount associated with cooling, such as an internal temperature, is reduced following a predetermined cooling characteristic. The programs have different cooling characteristics wherein each program is selectively stored in a control means, provided in the refrigeration unit, so as to be executable.~~

Please amend paragraph [0018] on page 7, as follows:

According to a twelfth aspect of the invention, the storing means stores a plurality of the cooling characteristics, and the operation control means executes an appropriate one of the cooling characteristics based upon the physical amount. ~~The invention of aspect 11 is characterized in that in aspect 2 a plurality of target pull down cooling characteristics is provided. Each pull down cooling characteristic is selectively readable according to a condition or the like.~~

Please amend paragraph [0019] on pages 7-8, as follows:

According to a thirteenth aspect of the invention, a plurality of the pull down cooling characteristics is provided, and an appropriate one of the plurality of the pull down cooling characteristics is executed based on the physical amount.~~The invention of aspect 12 is characterized in that in aspect 11 one of the pull down cooling characteristics is selectable according to the zone of the physical amount associated with cooling, such as an internal temperature.~~

Please amend paragraph [0020] on page 8, as follows:

According to a fourteenth aspect of the invention, the appropriate one of the plurality of the pull down cooling characteristics is executed based upon a zone of the physical amount.~~The invention of aspect 13 is characterized in that in aspect 11 each pull down characteristic is indicative of a time-varying mode of reduction in temperature. The condition is the difference between the set temperature and an actual internal temperature. The pull down cooling characteristic with a relatively smaller degree of temperature drop is selected when the difference is less than a predetermined value. The pull down cooling characteristic with a relatively larger degree of temperature drop is selected when the difference is above the predetermined value.~~

Please amend paragraph [0021] on page 8, as follows:

According a fifteenth aspect of the invention, the appropriate one of the plurality of the pull down cooling characteristics includes a small temperature drop degree when a difference between the physical amount and the target physical amount is less than a predetermined value. The appropriate one of the plurality of the pull down characteristics includes a large temperature drop degree when the difference between the physical amount and the target physical amount is greater than or equal to the predetermined amount.~~The degree of temperature drop is defined as the amount of temperature drop per unit of time.~~

Please amend paragraph [0022] on page 8, as follows:

According to a sixteenth aspect of the invention, the plurality of the pull down cooling characteristics includes an auxiliary cooling characteristic comprising a temperature curve in which a convergence temperature remains at a temperature higher by an auxiliary predetermined value than the set internal temperature. The auxiliary cooling characteristic is selected as the appropriate one of the plurality of the pull down cooling characteristics when a difference between the physical amount and an evaporation temperature of the evaporator is at or above a predetermined auxiliary temperature value or when the physical amount is higher than the target physical amount by a predetermined auxiliary temperature value.~~The invention of aspect 14 is characterized in that in aspect 13 one of the pull down cooling characteristics is an auxiliary cooling characteristic with a temperature curve in which a convergence temperature remains at a temperature, higher than the set internal temperature by a predetermined value. The auxiliary cooling characteristic is selected when a difference between the internal temperature and the evaporation temperature of the evaporator is at or above a predetermined value, or when the internal temperature is apart from a target temperature by a predetermined value or above.~~

Please amend paragraph [0023] on pages 8-9, as follows:

According to a seventeenth aspect of the invention, a refrigerating storage cabinet for refrigerating an inner atmosphere includes a refrigeration unit which comprises a compressor and an evaporator. The refrigerating storage cabinet comprises a storing means for storing a plurality of cooling characteristics comprising a target physical amount as a function of operating time and a physical amount sensor able to detect a physical amount corresponding to the target physical amount at predetermined intervals of operating time. The compressor comprises a plurality of performance levels. An operation control means controls the compressor by selecting an appropriate one of the plurality of performance levels based upon a relationship between the physical amount and the target physical amount for a corresponding operating time. The operation control means selects an appropriate one of the plurality of cooling characteristics based upon the physical amount. The target physical amount is determined from the appropriate one of

the plurality of cooling characteristics.~~The invention of aspect 15 is characterized in that in aspect 1 pull down cooling is performed in which an inner atmosphere is cooled from a high temperature apart from the set temperature, to near a set temperature. Control-cooling is performed in which the compressor is operated when the internal temperature has reached an upper limit temperature, higher by a predetermined value than the set temperature. The compressor is stopped when the internal temperature has reached a lower limit temperature, lower by a predetermined value than the set temperature. The compressor is repeatedly operated and stopped so that the inner atmosphere is maintained about the set temperature. With regard to a pull down cooling zone, the storing means stores the data of a pull down cooling characteristic indicative of a time-varying mode of reduction in a target physical amount associated with cooling, such as an internal temperature. The performance of the compressor is varied on the basis of the output of a temperature sensor, detecting the internal temperature, so that the internal temperature is reduced following a cooling characteristic read from the storing means. With regard to a control-cooling zone, the performance of the compressor is varied so that the internal temperature is reduced from the upper limit temperature to the set temperature by following the pull down cooling characteristic read from the storing means. The operation control means is provided for decreasing the performance of the compressor after the internal temperature has reached the set temperature.~~

Please amend paragraph [0024] on pages 9-10, as follows:

According to an eighteenth aspect of the invention, the physical amount and the target physical amount are temperatures. The physical amount is the temperature of the inner atmosphere, further. The compressor is controlled by the operation control means in which the cooling characteristic is a pull down characteristic while the physical amount is in a temperature range from above a high temperature to near a set temperature. The high temperature is higher than the set temperature by more than a predetermined value. An upper limit temperature is higher by the predetermined value than a set temperature. A lower limit temperature is lower by the predetermined value than the set temperature. A control-cooling zone is provided between and including the upper limit temperature to the lower limit temperature. When the physical amount is in

the control-cooling zone, the cooling characteristic is a control-cooling characteristic. The compressor is controlled by the operation control means wherein the control characteristic is a control-cooling characteristic when the physical amount is in the control-cooling zone from the upper limit temperature to the lower limit temperature. When the physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated. When the physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control means. ~~The invention of aspect 16 is characterized in that in aspect 1 the operation control means has a function of increasing the performance of the compressor when the internal temperature has reached the set temperature and rises again, after a reduction in the performance of the compressor.~~

Please amend paragraph [0047] on pages 18-20, as follows:

[FIG. 1] A perspective view of the refrigerator-freezer in accordance with embodiment 1 of the present invention;

[FIG. 2] An exploded perspective view thereof;

[FIG. 3] A diagram of freezing circuit;

[FIG. 4] A partial sectional view of a refrigeration unit;

[FIGS 5A and 5B]~~[FIG. 5]~~ Graphs showing the changes in pressure in a capillary tube;

[FIG. 6] A block diagram of control mechanism of an inverter compressor;

[FIG. 7] A graph showing a pull down cooling characteristic;

[FIG. 8] A flowchart showing a control operation of the inverter compressor;

[FIG. 9] A graph showing changes in the temperature in the control-cooling zone;

[FIG. 10] A graph showing internal temperature characteristics for comparison of the refrigeration and freezing sides;

[FIG. 11] A graph showing a pull down cooling characteristic in embodiment 2;

[FIG. 12] A flowchart showing a control operation for the inverter compressor;

[FIG. 13] A graph showing a control-cooling characteristic;

[FIG. 14] A figure showing a reference table based on a pull down cooling characteristic in embodiment 3;

[FIG. 15] A flowchart showing a control operation for the inverter compressor;

[FIG. 16] A figure showing a reference table based on a control-cooling characteristic;

[FIG. 17] A graph showing a pull down cooling characteristic in embodiment 4;

[FIG. 18] A graph showing a mode of control-cooling in embodiment 5;

[FIG. 19] A graph showing a mode of control-cooling in embodiment 6;

[FIG. 20] A flowchart showing a control operation for the inverter compressor;

[FIGS. 21A and 21B] An explanation and a graph of changes in the internal temperature in embodiment 7, respectively;

[FIG. 22] A graph showing a cooling control manner in embodiment 8;

[FIG. 23] A graph showing a cooling control manner in embodiment 9;

[FIG. 24] A graph showing a cooling control manner in embodiment 10;

[FIG. 25] A graph showing temperature changes in the control-cooling zone in a related art; and

[FIG. 26] A graph showing temperature curves in the pull down cooling zone in the prior art.

Please amend paragraph [0073] on pages 29-30, as follows:

In the refrigerating circuit 31 with the capillary tube 35, the high-pressure side and the low-pressure side basically share the refrigerant. Conceptually, in the refrigeration range the refrigerant is in the condenser 33 and the evaporator 36(including the pull down cooling range), whereas a large amount of refrigerant is in the evaporator 36 and accumulator 42 and a small amount of refrigerant is in the condenser 33 in the freezing range. Accordingly, the refrigerant flows into the capillary tube 35 as a completely liquid flow in the refrigerating range. However, since the refrigerant flows in the mixed gas-liquid state in the freezing range, the flow rate of the refrigerant is reduced. Accordingly, even when heat exchange is carried out at a position nearer to the inlet of the capillary tube 35 such that excessive cooling occurs, the flow rate of the refrigerant is not greatly increased.

Please amend paragraph [0074] on page 30, as follows:

On the contrary, as a result of the provision of the accumulator 42, there is a possibility that the flow rate may be reduced in the refrigeration range (including the pull down cooling range). However, for a reason opposite to the reason previously provided, the compressor 32 circulates a large amount of refrigerant in the refrigeration range (including the pull down cooling range). Accordingly, the amount of excess liquid refrigerant in the freezing circuit 31 is small. Because of this, only a little liquid refrigerant is stored in the accumulator 42. Therefore, it is considered that there is almost no possibility of a reduction in the flow rate in the refrigeration range.